DEPARTMENT OF THE NAVY
BOARD OF INSPECTION AND SURVEY
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INSURV INSTRUCTION 4730.23C

From: President, Board of Inspection and Survey

Subj: STANDARDS FOR MINE HUNTING AND SWEEPING EQUIPMENT DEMONSTRATIONS

1. Purpose. To establish President, Board of Inspection and Survey (INSURV) policy and standards for demonstrating the material condition of mine hunting and sweeping equipment during INSURV trials and inspections.

2. Cancellation. INSURV Instruction 4730.23B

3. Policy. Mine warfare demonstrations will be conducted on all MCM-1 AVENGER and MHC-51 OSPREY class ships.

4. Discussion. Mine warfare equipment demonstrations are non-tactical exercises of mine hunting and mine sweeping equipment capabilities. The Mine Hunting Demonstration will exercise mine hunting, classification, and neutralization systems. The Mine Sweeping Demonstration will exercise mine sweeping systems including deck-handling equipment, and magnetic and acoustic mine countermeasures equipment. Navigation, propulsion and auxiliary equipment supporting mine warfare operations are also included in the evaluation.

a. The essential steps of the Mine Hunting Demonstration are:

(1) Acquisition and classification using the AN/SQQ-32(V) sonar

(2) Plotting ship and mine positions on the AN/SSN-2 Precise Integrated Navigation System (PINS) or AN/SYQ-13 Command and Control System (as applicable)

(3) Deployment and simulated mine neutralization using the AN/SLQ-48(V) Mine Neutralization System (MNS) and an inert Mission Package 3 (MP3)

(4) Deployment of the AN/SQH-4A Battle Space Profiler (BSP)

b. The essential steps of the Mine Sweeping Demonstration are:

(1) Rigging, streaming and pulsing of the magnetic cable

(2) Rigging, streaming and activation of the acoustic power cable and acoustic device

(3) Plotting ship and swept areas on PINS or AN/SYQ-13

c. The material condition of the following equipment (as applicable) will be inspected/demonstrated:

(1) AN/SQQ-32(V) Sonar

(2) OK-520 Winch

(3) PINS or AN/SYQ-13

(4) AN/SLQ-48(V) Mine Neutralization System

(5) Vehicle Handling System (VHS) or Multi-purpose Crane (MPC)

(6) AN/SQH-4A Battle Space Profiler (BSP)

(7) Bow Thruster

(8) Light Load Propulsion Motors (LLPM)

(9) Hydraulic Power Units (HPUs)

(10) Magnetic Sweep Generator/Wave Form Generator

(11) Magnetic Cable including CL3 cable, TJ3 Jumper, and reel/winch assembly

(12) Acoustic Power Cable including reel/winch assembly

(13) Mechanical retrieval system for the magnetic and acoustic reel (must be demonstrated prior to the sweep demonstration)

(14) Dual operation of the magnetic and acoustic reels (MCM 9-14)

(15) Mk 4 and Mk 6 (TB 27/26) Acoustic Devices

(16) Mechanical Mine Sweep equipment

(17) Deck cranes used for mine warfare equipment

(18) Instrumented Sheaves and associated displays

5. Mine Hunting

a. Preparation

(1) For ships with MP3 capability, the ship is responsible for arranging placement of a suitable mine shape for conduct of the mine hunting demonstration using MP3. Ships not equipped with MP3 shall anchor a mine-like object (Diablo FMK 11 Mod 0 sonar reflector or equivalent) within ten feet of the bottom and suspend from a buoy.

(2) The ship shall be positioned in an area with minimal shipping present.

(3) The ship shall conduct a sonar condition check, using the BSP, to determine optimal equipment setup.

(4) Mine "DATUM" shall be entered into PINS/SYQ-13 and displayed on the command and control consoles and plotter. The ship shall reposition just beyond the maximum predicted detection range of the sonar, or 1200 yards if BSP data is not available.

(5) The AN/SLQ-48(V) Mine Neutralization Vehicle (MNV) shall be prepared for launch. For ships with MP3 capability, an inert MP3 will be mounted on the MNV and employed during the demonstration.

(6) All equipment should be fully operational in normal (not casualty) mode and meet PMS specifications. In addition, critical installed monitoring and support systems (e.g. DRT, electronic cooling, electrical power, etc.) should be operational to support mine hunting.

b. Procedures

(1) The ship will lower the sonar to the depth required to maximize contact based on water conditions indicated by the BSP (Variable Depth Sonar (VDS) operations, including Automatic Haul-In (AHI), and alarms/warning indicators (TB too close 20') must be demonstrated some time during the inspection to verify OK-520 winch performance).

(2) The ship will approach the DATUM using only the LLPMs and bow thruster (MCM) or minehunt mode (MHC) until sonar contact is gained on the mine-like object positioned earlier. The sonar contact position will be passed to the PINS/SYQ-13 system and plotted.

(3) After the contact is classified as a mine-like object the ship will maintain a standoff distance of 200-500 yards. Based on the results of the sonar detected mine-like object position, the MNV will be launched and "flown" to the sonar contact position.

(4) The MNV will be directed to the mine-like object, obtain contact of the object with the MNV sonar, sight the object with the camera, and deploy the inert MP3. Ships not having MP3 capability will simulate setting a demolition charge (MP2). The MNV will back away from the inert MP3, maintaining visual contact until verification of a successful MP3 float release.

(5) A "release" signal will be transmitted using the AN/WQC-2. If float release is unsuccessful, release shall be attempted using the Over-the-Side transducer. For ships without MP3 capability, a device detonation signal will be transmitted using the AN/WQC-2.

(6) Once the float is verified as released, the MNV shall be flown back to the ship and recovered.

(7) The operation of Umbilical Cable Handling System (UCHS) will be monitored throughout the mine hunting demonstration.

(8) The MNV will be stowed for sea while the mine-like object is recovered.

6. Mine Sweeping

a. Preparations

(1) The ship shall be positioned in an area with minimal shipping present.

(2) Mechanical sweep gear will be inventoried and inspected, and deck winch operation will be validated prior to demonstration.

(3) The TB-26 or TB-27 not being demonstrated in the water will be tested on deck.

b. Procedures

(1) The ship will rig and stream a combination magnetic and acoustic (MK 6(h)) sweep, using their acoustic device stowed on the starboard side, with a MK 9 end cutter and MK 15 breakaway cutter only.

(2) Once deployed, the magnetic tail will be pulsed using waveform 1 (5.5 seconds on-time and 9.5 seconds off-time) incrementally increasing current to maximum current (5000 amps/120 VDC). Maximum duty cycle will be maintained for a minimum of 15 minutes.

(3) The streamed acoustic equipment will be energized and the Power Converter Unit RPM meter observed.

(4) The operation of Hydraulic Power Units (HPUs) in their normal operating configuration will be monitored throughout mine sweeping operations.

(5) Dual operation of the magnetic and acoustic reels will be demonstrated (MCM 9-14).

(6) Upon completion, the sweep configuration will be recovered.

7. Evaluation Criteria

a. Mine Hunting Demonstration

(1) Satisfactory Mine Hunting Demonstration. The following conditions must be met to achieve a "satisfactory" mine hunting demonstration evaluation:

(a) All installed navigation, mine detection, classification and plotting equipment supported mine detection and plotting of the mine-like object.

(b) All installed deck handling equipment supported MNV deployment.

(c) The MNV propulsion, controls, video, and sonar operated without fault or failure.

(d) The MP3 was successfully deployed (attached) and the float released upon signal from the AN/WQC-2.

(e) A destruction device signal was transmitted (non-MP3 ships).

(f) All propulsion and auxiliary system operations (including LLPM, bow thruster, propulsion control modes, and HPUs) satisfactorily supported mine detection and neutralization.

(2) Degraded Mine Hunting Demonstration. Any of the following conditions will result in a "degraded" mine hunting demonstration evaluation:

(a) Navigation, mine detection, classification or plotting equipment faulted or failed during the demonstration, but system reboot or backup modes allowed detection and plotting of the mine-like object.

(b) Deck handling equipment supported MNV deployment, but not in the normal operating configuration.

(c) The MNV located and classified the mine-like object, but could not be controlled due to an equipment failure.

(d) The MP3 could not be successfully deployed (attached) to the mine shape.

(e) The MP3 could be deployed, but the float could not be released by a signal transmitted from the AN/WQC-2 or over-the-side transducer.

(f) Propulsion or auxiliary system operations (including LLPM, bow thruster, propulsion control modes, and HPUs) failed to operate in the mode designed to support mine detection and neutralization, but alternate modes or alignment allowed completion of the demonstration.

(3) Unsatisfactory Mine Hunting Demonstration. Any of the following conditions will result in an "unsatisfactory" mine hunting demonstration evaluation:

(a) The ship's navigation, mine detection, mine classification, or plotting equipment failed.

(b) The OK-520 winch failed or was unable to support sonar operations.

(c) Deck handling equipment did not support MNV deployment.

(d) The AN/SQQ-32(V) or the MNV did not locate the mine-like object.

(e) Propulsion or auxiliary systems did not support completion of demonstration.

b. Mine Sweeping Demonstration (if applicable)

(1) Satisfactory Mine Sweeping Demonstration. All the following conditions must be met to achieve a "satisfactory" mine sweeping demonstration evaluation:

(a) All installed navigation and mine plotting equipment supported successful mine sweeping operations.

(b) Both the magnetic and acoustic mine sweeping cables were successfully deployed and energized to PMS and technical manual specifications.

(c) Deck handling equipment supported mechanical and influence sweep gear.

(d) Propulsion and auxiliary system equipment (HPUs and steering) supported mine sweeping operations.

(2) Degraded Mine Sweeping Demonstration. Any of the following conditions will result in a "degraded" mine sweeping demonstration:

(a) Navigation and mine plotting equipment faulted or failed during the demonstration, but system reboot or backup modes allowed successful track following and mine plotting.

(b) Either the magnetic or the acoustic mine sweeping cables could not be deployed and energized to PMS or technical manual specifications.

(c) Deck handling equipment supported mechanical and influence sweep gear deployment, but not in the normal operating configuration.

(d) Propulsion or auxiliary systems failed to operate in the normal mode designed to support influence and mechanical sweeping operations, but alternate modes or alignment allowed completion of the demonstration.

(3) Unsatisfactory Mine Sweeping Demonstration. Any of the following conditions will result in an "unsatisfactory" mine sweeping demonstration evaluation:

(a) The magnetic and acoustic mine sweeping cables could not be streamed or meet major PMS or Technical Manual specifications.

(b) Deck handling equipment did not support mechanical or influence sweep gear deployment.

(c) An inventory/inspection showed that the mechanical sweeping equipment onboard was inadequate to support the mine sweeping demonstration.

(d) Propulsion or auxiliary systems did not support completion of demonstration.

c. Mine Hunting and Mine Sweeping Not Demonstrated. The demonstrations will be evaluated "not demonstrated" if they cannot be conducted for reasons not associated with the mine hunting and sweeping equipment, required mine hunting propulsion systems or modes, and required auxiliary equipment.

8. Responsibility. As with all ship's operations, the Commanding Officer retains responsibility for the safe conduct of this demonstration and for ensuring all applicable safety precautions are enforced. Nothing is more important than the safety of all personnel and equipment.

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